

Test & Evaluation

*"Opportunities For Making
It Better"*

Tom Williams

Overview

- **What's Driving T&E Process Today?**
- **How Was it Done Before?**
- **Opportunities Afforded By Acquisition Reform**
- **What's Industry Doing?
(A Contractors Perspective)**
- **What Can We Do To Make It Even Better?**

Changes Affecting the T&E Process

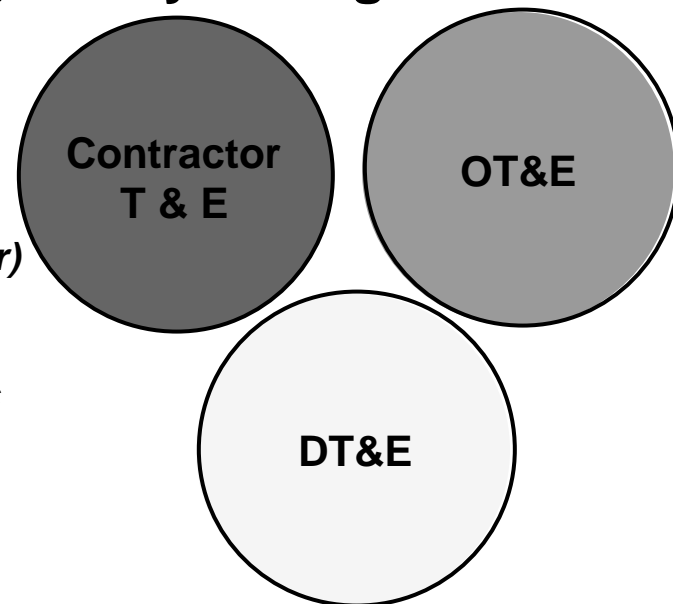
- **Business Environment Is Forcing New Ways of Thinking**
 - Funding, Test Infrastructure, Resources & Workforce Experience
- **Computing Power**
 - Better Modeling and Simulation Capability
- **Acquisition Reform**
 - Concept Papers Can Be Used To Expedite Change
 - DoD 5002.2-R Defines the Need For An Effective T & E Strategy Up Front



***T&E – Working
to Make It Better***

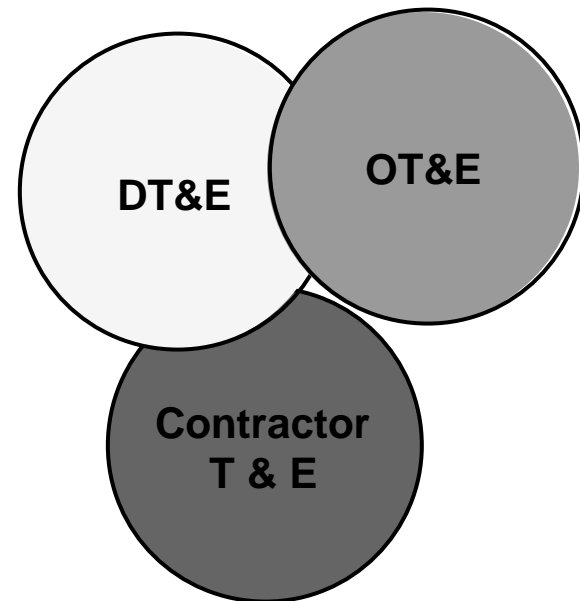
The Old Way Of Doing Business

- **Separate and Distinct – Interpretations of Title 10**
 - **Independency Regardless of Cost**
 - **Test Community Involved at the End of the Program**
 - **Inability to Affect Design Early Enough**
- ***Separate Test Programs & Communities***
- ***Competition Rather than Collaboration***
(Government/Government/Contractor)
- ***Spoke “Different Languages”***
- ***Limited Sharing of Test Facilities and Capabilities***
 - ***DoD***
 - ***NASA***
 - ***Industry***



Current State

- **We Are Doing Things Differently**
 - **DoD, Program Office & T & E Community Open To New Ideas**
- *Combined Test Forces*
- *Test Process Working Groups*
- *Consolidation / Sharing Resources Between Government / Industry*
 - *Laboratories*
 - *Test Ranges*
 - *Wind Tunnels*
 - *NASA*
 - *DoD*

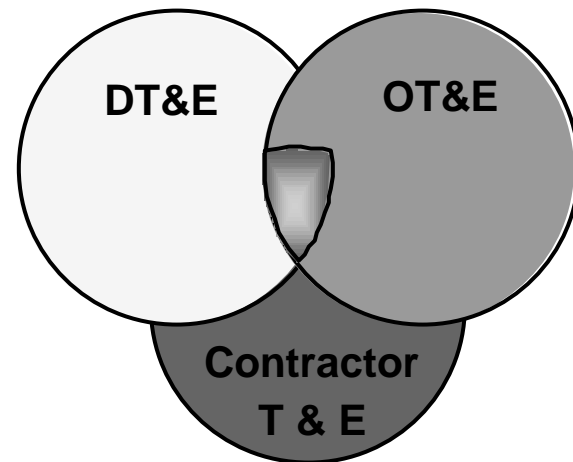


The Future

Going The Next Step

- **Open Access to Test Data During OT&E**
- **Contractor Observation During OT&E**
- **Avoid Costly Procurement Gaps On Upgrade Programs**

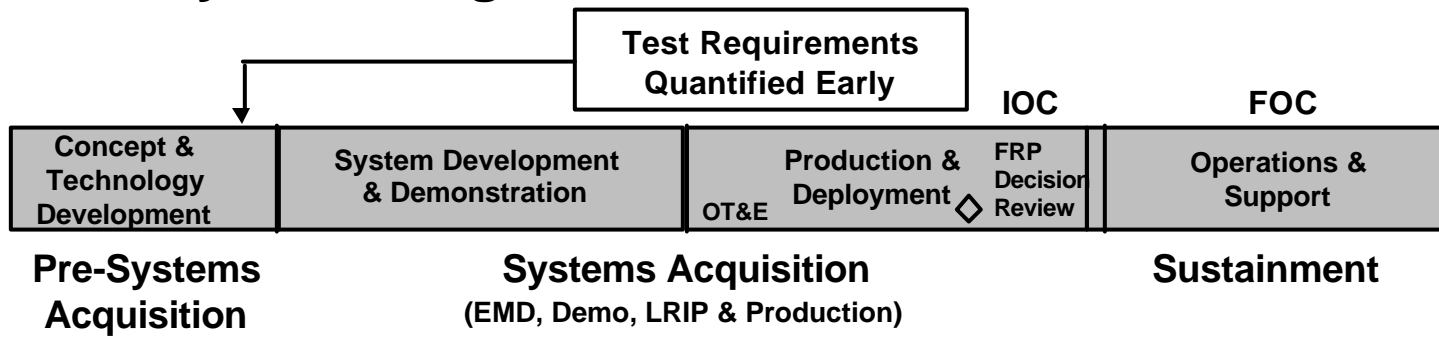
Independent T & E Doesn't Have to Mean Independent Test Assets and Resources



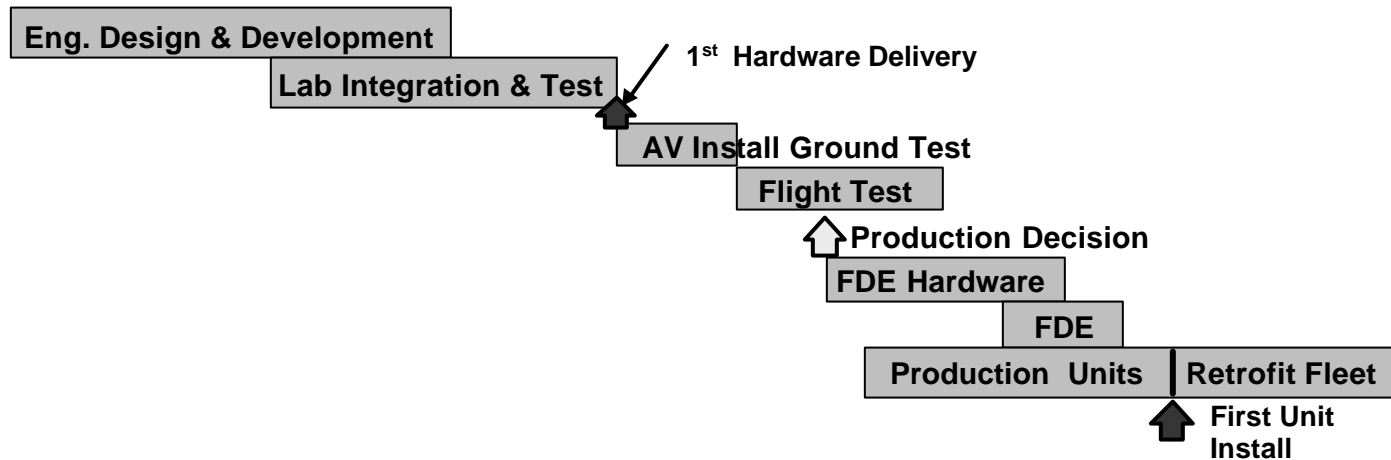
**Early
Involvement is
the Key!**

Opportunities for Change

New System Program

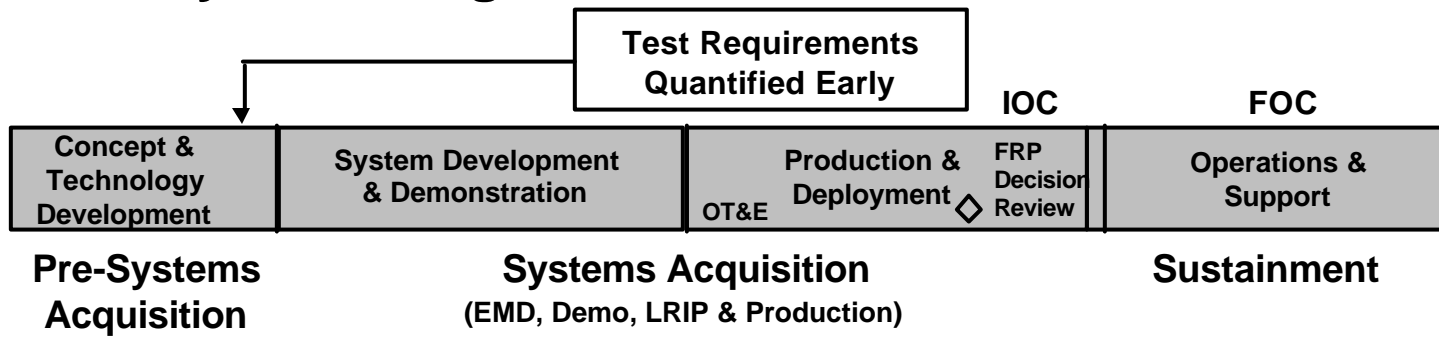


Upgrade / Mod Programs

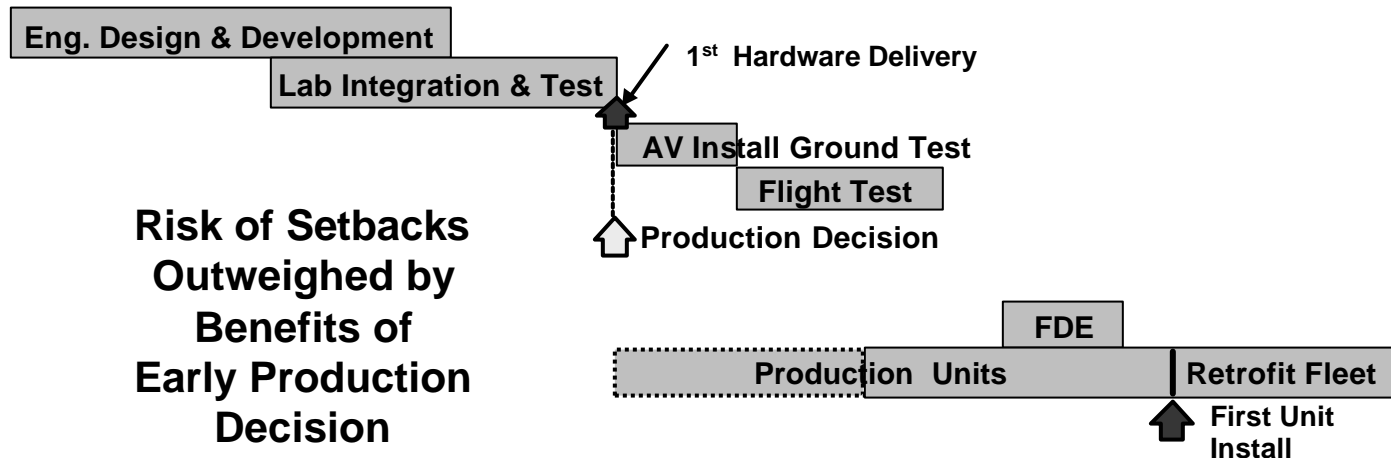


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New System Program

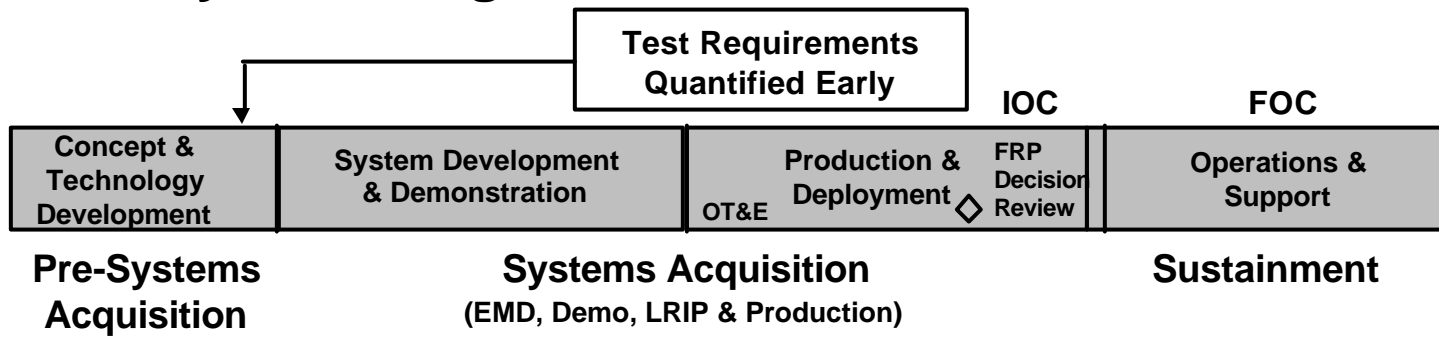


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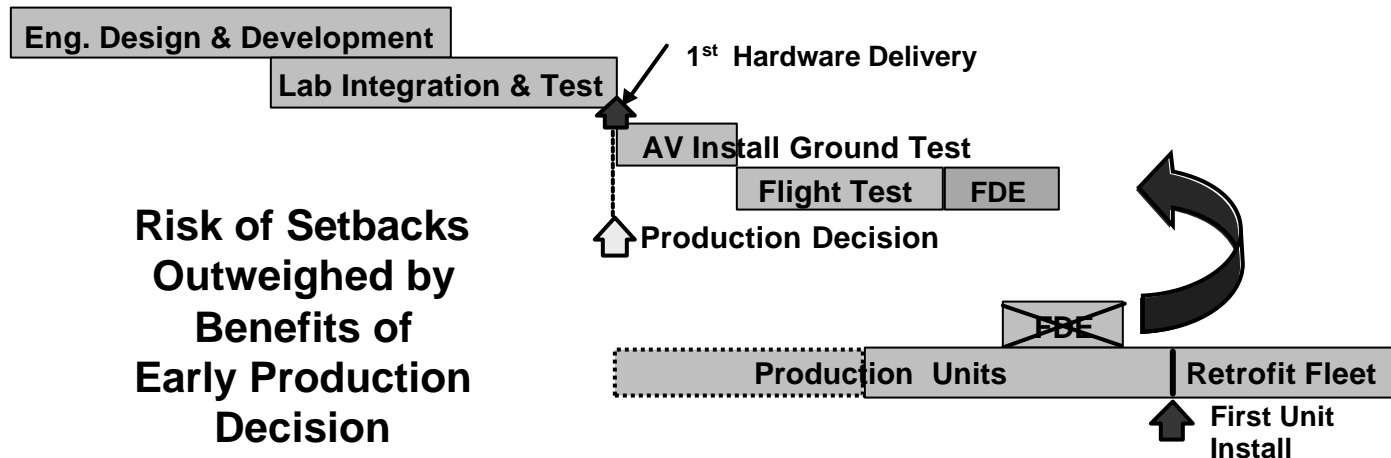


Opportunities for Change

New System Program



Upgrade / Mod Programs



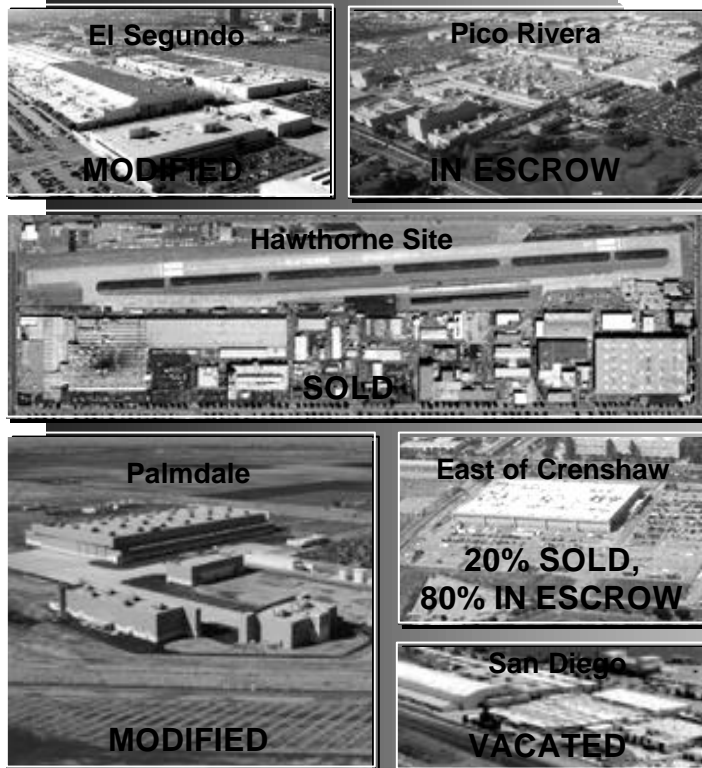
What Northrop Grumman is Doing Different

- **Consolidation of Resources**
 - **We Don't Need to Own Everything**



Facilities Consolidation

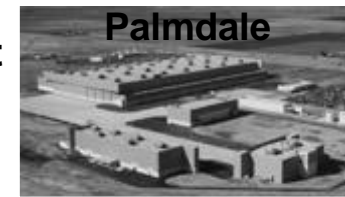
1999 (75 Labs)



2001 (32 Labs)



- F/A-18E/F Production
- T-38 Wing Production
- R&D Labs



- B-2 PDM
- Unmanned Systems Production



- Unmanned Systems EMD

\$135M
Investment
In
Future

\$40M
In Lab
Relocation
Investments

Air Combat Systems

Vision:
Provide Total Customer Solutions
for Integrated Strike Warfare

Strategic Objectives:

● ***Perform***

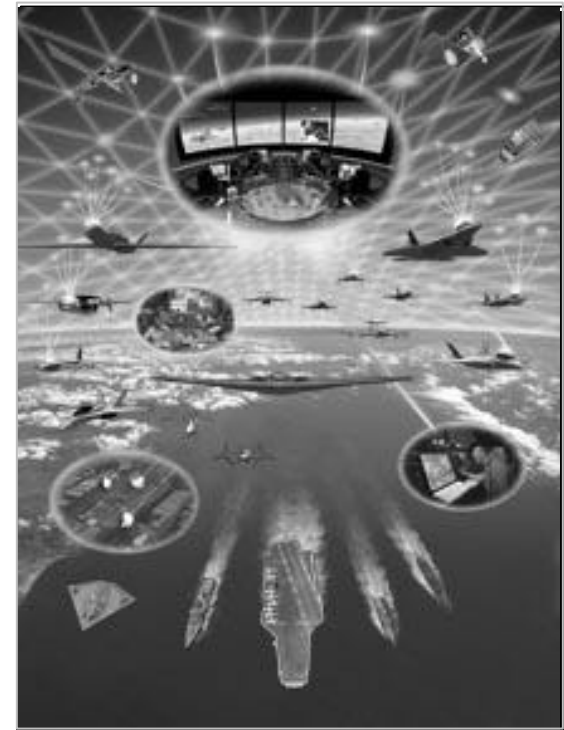
Maintain a Relentless Customer Focus

● ***Position***

Increase Competitiveness

● ***Grow***

Win New Business



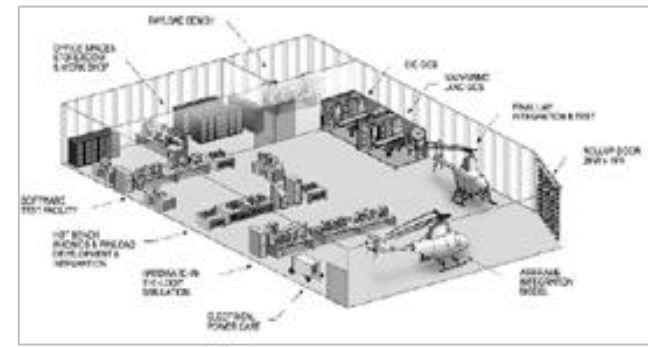
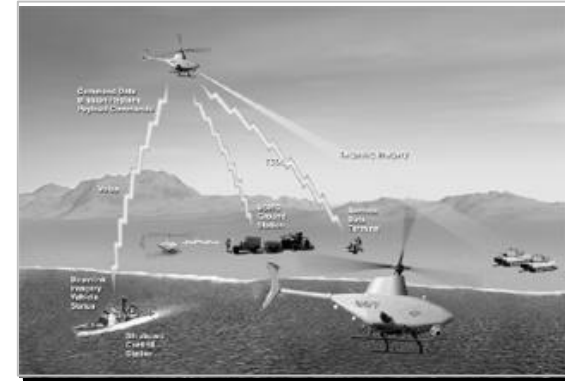
What Northrop Grumman is Doing Different

- **Consolidation of Resources**
 - We Don't Need to Own Everything
- **Common Homeroom For All T&E Services**
 - Service All Programs
 - Generates Synergy by Common Processes, Shared Resources, Training and Lessons Learned



What Northrop Grumman is Doing Different

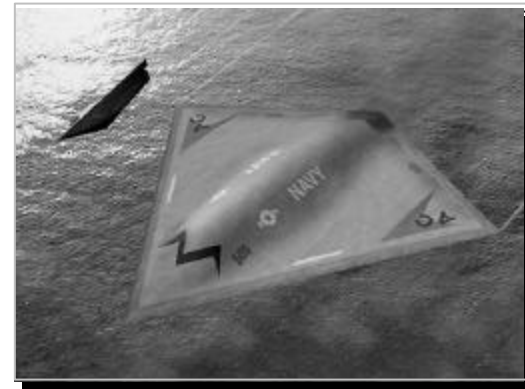
- **Systems Centers**
 - Complete End-to-End Testing
 - Utilize Actual Satellite Communication Links, Flight Hardware/Software, Mission Plans & Sensors
 - Proven Performance with Legacy Systems
 - Total Systems Solutions
 - Address Technical Risks
 - Up-Front
 - Virtual Testing With Validated Models and Simulation



“All of our air vehicles manned or unmanned, current or future are part of a broader system architecture – we must test the entire architecture to prove the air vehicle part meets and exceeds our customer’s expectations.”

Opportunities For Making It Better

- **Remove Barriers Between Contractor/ T&E / DT&E / OT&E**
- **Involve Government and Contractor Test and Evaluation Communities Earlier in the Programs**
 - **Contribute to Evolving Product Design**
 - **Improve Product Performance**
 - **Reduce Risk**
- **Smart Utilization of Virtual Test & Evaluation Tools**
- **Continued Right Sizing of Available Test Assets (Govt and Contractor)**



Independent and Interrelated – We Can Be Both!

